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The Intention of Adopting Information Technology for SMES in Special Region of Yogyakarta

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Abstract

This study aims to examine the intention of adopting information technology for SMEs in DIY through the expansion of the technology acceptance model. This research continues the previous research related to aspects of obstacles experienced in the development of SME businesses. The research conducted a survey using a sample of SMEs entrepreneurs in DIY. The data analysis technique in this study uses structural equation models that are assisted by the AMOS program. Overall, the expansion model of the technology acceptance model in predicting the intention of adopting SME's information technology in this study fulfils the model fit rules, which means that the model developed in this study is by existing empirical conditions. In particular, the results of the study prove the influence of business competition pressure on the usefulness of SME owners. It also found that ease of use and perceived usefulness have an effect on the attitudes towards SMEs information technology adoption of SMEs owners, and the attitudes on the adoption of SMEs information technology affect the intention of adopting SME's information technology.

Determinan Intensi Adopsi Teknologi Informasi pada UMKM di Daerah Istimewa Yogyakarta

Abstrak

Penelitian ini bertujuan untuk menguji niat mengadopsi teknologi informasi UMKM di DIY melalui perluasan model penerimaan teknologi. Penelitian ini melanjutkan penelitian sebelumnya terkait dengan aspek hambatan yang dialami dalam pengembangan bisnis UMKM. Penelitian yang dilakukan bersifat survei menggunakan sampel pengusaha UMKM di DIY. Teknik analisis data dalam penelitian ini menggunakan model persamaan struktural yang dibantu oleh program AMOS. Secara keseluruhan, perluasan model penerimaan teknologi dalam memprediksi niat mengadopsi teknologi informasi UMKM dalam penelitian ini memenuhi aturan model yang fit, yang berarti bahwa model yang dikembangkan dalam penelitian ini sesuai dengan kondisi empiris yang ada. Secara khusus, hasil penelitian membuktikan pengaruh tekanan persaingan bisnis pada persepsi manfaat pada pemilik UMKM. Penelitian ini juga menemukan pengaruh kemudahan penggunaan dan manfaat yang dipersepsikan memiliki efek pada sikap pada adopsi teknologi informasi pemilik UMKM dan sikap pada adopsi teknologi informasi UMKM berdampak pada niat mengadopsi teknologi informasi UMKM.

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INTRODUCTION

In general, micro, small, and medium enterprises (SMEs) have good competitiveness in the economy. SMEs can survive and play a role in carrying out their functions both in producing goods and services when the Indonesian economy is faced with multi-dimensional economic problems, and the conditions of big business cannot maintain its existence. This is quite reasonable considering that the SMEs sector has the prospect of being developed, also has different characteristics with large companies. In addition to having advantages over other business scales, micro-SMEs also play an essential role in the national economy. SMEs have a strong influence on the economics of all states (Ladzani & Vuuren, 2002). SMEs contribute to national economic stability both in all developing countries and developing countries (Myslimi & Kacani, 2016). SMEs are the most dynamic business in all countries and have a crucial role in achieving socio-economic goals (Ruchkina et al., 2017).

SMEs contribute more than 75% of national products in various countries (Asian Productivity Organization, 2011). The roles of SMEs include: 1) as employment that can absorb a lot of labour so that it has the potential to reduce unemployment and poverty, 2) contribute to the increase of Gross Domestic Product (GDP) and economic growth, and 3) contribute to increasing of exports while also potentially expanding exports and investment (Heatubun, 2006). In line with the increase in the number of SMEs, overall, the number of workers absorbed in this type of business also increased by around 2.47% in the same period. For example, in America, of the 25 million businesses, around 99% come from small-scale companies that employ less than 100 people per company. Small companies have created two-thirds to three-quarters of new jobs in the economy of the United States. Small companies account for 51% of the country's private sector (GDP) (Zimmerer & Scarborough, 2005).

The development of an economic system that relies on small and medium enterprises will encourage the growth of an entrepreneurial economy, which in turn, promotes the growth of new businesses (Wijaya, 2009). SMEs act as engines of economic growth, the foundation of creativity and innovation, and the forerunner of entrepreneurship (Asian Productivity Organization, 2006). The spread of small and medium enterprises in rural areas can encourage equal employment opportunities which contribute to the reduction of unemployment. The existence of SMEs is one of the alternatives to tackle poverty and job creation (Rufaro et al., 2008) because it has strong resilience when Indonesia experiences an economic crisis (Niode, 2009).

The need for information technology starting now referred to as IT has become an essential requirement for every business unit, especially in carrying out its activities. Access to business information is identified as an important area that requires attention from the government when the SME sector in developing countries is experiencing growth and growth (Kamunge et al., 2014). Several studies identified the importance of technology for access to information and business development of SMEs in the form of internet /e-business (Ifinedo, 2011), e-commerce (Barry & Milner, 2002), and communication and information technology (Mutula & Brakel, 2006; Rufaro et al., 2008). Knowledge of technology and lack of business information is also part of the problem of non-financial organizations for SMEs (Niode, 2009). The ability of SMEs to survive in an increasingly competitive global environment depends on the capacity of the information they have (Mutula & Brakel, 2006).

Data from the Director-General of Small and Medium Industries of the Ministry of Industry shows that from the number of SMEs around 40 percent outside Java and 60 percent in Java, only 30-40 percent have utilized the sophistication of IT (information technology) to develop their business. The results of preliminary research conducted by Astuti (2018) in exploring the profile of SMEs, especially in the city of Yogyakarta, found many complex and diverse problems faced by SMEs. One of the issues related to the development of SMEs is the limited human resources in the adoption of information

technology. The problem faced with SMEs is the lack of access to information, especially market information. This is an obstacle in terms of marketing its products because, with limited access to market information that can be obtained through information technology has resulted in low market orientation and weak competitiveness at the global level. Knowledge is an essential aspect of the decision making process for small and medium enterprises (Mutula & Brakel, 2006). Information barriers related to the accessibility of SMEs to information needed while expanding the business (Dasanayaka et al., 2011; Trianni & Cagno, 2012). Having no knowledge about market opportunities, technological change is seen as another obstacle to accepting the innovation (Kamalian et al., 2011).

IT acceptance causes organizations to need to prepare human resources that operate the technology. This is related to behaviour that exists in individuals in the organization concerned. Every individual who has the intensity in using information technology is influenced by the perception of the individual who perceives the function of the technology that has an impact on their decision to accept or reject existing technology. The better the individual's attitude about the benefits of technology, the better their acceptance of the technology. The condition of information technology can or cannot be accepted by an individual is a critical stage for the implementation of information technology (Compeau & Hinggins, 1995). One of the factors that influence the implementation of technology is the acceptance of the system (Davis, 1989).

Research on the intention of adopting information technology is of interest to researchers in various Asian and European countries. Theoretically, various studies are developed and applied in technology adoption research referring to the concept of Technology Acceptance Model (TAM) has a better ability to explain the acceptance of information systems than other models (Davis et al., 1989; Mathieson, 1991; Adam & Nelson, 1992; Taylor & Todd, 1995). The studies found that TAM was able to explain the variance of intention or use of information systems around 40%. Previous studies have not been comprehensive in explaining the intention of adopting information technology for SMEs. Research carried out using an extension of the Technology Acceptance Model (TAM) or technology acceptance model in explaining the intention of adopting SMEs information technology by involving external factors comprehensively, namely the pressure of business competition.

The novelties og this research arise from some of the problems identified by SMEs in Yogyakarta are limited human resources in the adoption of information technology and the use of information technology in obtaining business information. The obstacle in the field of marketing in terms of marketing its products widely, lacking information about market opportunities, changing technology is seen as another obstacle to innovation. The general objective of this research is to develop an empirical design for expanding the model of technology acceptance in predicting the intention of adopting SME's information technology. In particular, the aim is to examine the effect of business competition pressure variables on perceived usefulness, the influence of ease of use variables and the usefulness of attitudes on SMEs information technology adoption and the influence of attitude variables on adoption SMEs information technology towards the intention of adopting SMEs information technology.

Hypothesis Development

The TAM is adopted from the TRA model (Buabeng-Andoh, 2018), which is a theory of reasoned action with the premise that a person's evaluations and perceptions of things will determine the attitude of that person. The evaluations of users of Information Technology (IT) will influence their attitude towards the acceptance of these technologies. The determinant factors that can affect the user's perception as a reasonable action in the context of technology users are perceived usefulness and IT ease of use so that someone's reason for seeing the benefits and ease of use of IT makes the person's behaviour for receiving the technology.

The TAM was developed to explain the behaviour of IT users, which is based on belief, attitude, intention, and user behaviour. Davis (1989) explains that the behaviour of technology acceptance is formed by the intention of receiving technology, and the intention of receiving technology is largely determined by the attitude of the user to the technology itself. Individual attitudes toward technology are influenced by two main components, namely usefulness and ease of use. Components of usefulness and ease of use that are perceived by the user are also influenced by external factors.

Davis (1989) explains that the behaviour of technology acceptance is also formed by external factors. Components of perceived by the user are also influenced by external factors. The perceived benefits of information technology adoption are also driven by environmental aspects which force the adoption of IT such as the pressure of business competition. The pressure in the form of business competition is an external aspect that stimulates technology acceptance. The influence of business competition pressure factors is supported by the findings of (Moy & Luk, 2003; Zhu et al., 2003; Xiaolin 2008; Rowe et al., 2012; Al-Fahim et al., 2016). Competitive pressure refers to the level of pressure from competitors, which is an external force that pressures a company to adopt new technology to compete (Zhu et al, 2003). Conducted a study in Vietnam found that competitive pressures encouraged the adoption of technology in a business entity (Rowe et al., 2012). Competitive pressure not only affected the behaviour intention of SMEs to adopt technology but also indirectly through perceived benefits (Xiaolin, 2008). Competitive pressures influenced the intention of using SME technology owners through perceived usefulness (Al-Fahim et al., 2016).

The pressure in the form of business competition is an external aspect that stimulates technology acceptance. Competition pressure refers to the level of pressure from competitors, which is an external force that forces companies to adopt new technology to compete (Zhu et al., 2003). A study in Vietnam in 926 SMEs found that competitive pressures encouraged the adoption of technology in a business entity (Rowe et al., 2012). Competitive pressure not only affected the behaviour intention of SMEs to adopt the technology but even indirectly through perceived benefits (Xiaolin, 2008). Competitive pressures influenced the intention of using SME technology owners through perceived usefulness (Al-Fahim et al., 2016). Study of barriers to SMEs growth in Hong Kong managed to identify business constraints, including insufficient marketing knowledge, poor product performance, and lack of awareness of competitive pressures (Moy & Luk, 2003). The intensity of competition played a role in the adoption or acceptance of information technology in the form of a internet and e-business of SMEs in Canada (Ifinedo, 2011)

The expansion of the model in this study considers external factors as the initial antecedents in the model of technology acceptance in SMEs, namely the pressure of business competition. Based on theoretical studies and previous studies, the following hypothesis is proposed:

H1: Variable pressure on business competition influences perceived usefulness

Davis (1989) explains that the behavioural acceptance model of technology is formed by aspects of the intention to accept technology, and the intention of receiving technology is largely determined by the attitude of the user to the technology itself. Individual attitudes toward technology are influenced by two main components, namely usefulness and ease of use. In the opinion of Venkatesh (1999) that perceived convenience is a process of expectation (expectancy). The perceived ease is believed to have a strong influence in forming a person's attitude in accepting information technology. The perceived usefulness is believed to have a strong relationship in influencing the attitude of users of information technology. It's can be understood because when an individual feel that information technology is used to provide usefulness to him, both in completing his tasks or daily activities, the individual will be

satisfied with the technology. The hypothesis proposed is as follows:

H2: Perceived ease of use and perceived usefulness affect SMEs attitudes towards information technology adoption

H3: The attitude of the IT adoption influences the SMEs intention of IT adopting

METHOD

The research conducted attempts to test the model that refers to the development of a technology acceptance model. The paradigm in this study is oriented towards the positivist paradigm. The positivism paradigm emphasizes theory verification or model testing by prioritizing a deductive approach.

Data and Data Collection Techniques

This study uses primary data collected through surveys with questionnaires. Scores are arranged based on a Likert scale. Some basic references are the adaptation of questionnaires that have been used by several previous studies.

The research variable data level collected in the form of interval data scores and operational definitions related to the meaning of all latent variables used in this field research is described and explained as follows.

Perceived Ease of Use

The perceived ease is the extent to which a person believes that using technology will be free of effort (Davis, 1989). Davis (1989) uses indicators to form this construct that is easy to learn, controllable, clear & understandable, flexible, easy to become skilful, and easy to use.

Perceived Usefulness

Perceived usefulness is defined as the extent to which a person believes that using technology will enhance his or her performance (Davis, 1989). Davis (1989) uses indicators to form this construct, namely work more quickly, job performance, increase productivity, effectiveness, makes a job easier, and useful.

Attitude of IT Adoption

The attitude of IT adoption is defined according to the adaptation of Mathieson (1991), namely attitudes toward behaviour as a user evaluation of their interest in adopting IT. The attitude of adoption of information technology is measured by a favourite indicator of information technology, supports technology adoption, trust in information technology, and positive responses or likes to use information technology.

Intention of IT Adoption

The intentions of technology adoption in question is the desire of individuals to use the same information technology if one day needs it (Taylor & Baker, 1994). Technological adoption intention is measured by indicators of a desire to use information technology in obtaining business information, the desire to adopt information technology in the production process, and the desire to intensively use information technology in business management.

Pressure on Business competition

The pressure on business competition in question is the level of pressure from competitors, which is an external force to pressure companies to adopt technology to avoid decreasing competition power (Zhu et al., 2003). The pressure on business competition is measured by competitor indicators that adopt information technology, the use of information technology in marketing, competitors who have adopted information technology in the production process, and competitors who have adopted information technology in the distribution process.

Data Quality Testing

The validity tested is factor validity through convergent validity. Decision making regarding the suitability of latent variables with

observed variables is determined by the criteria for the minimum value of the loading factor of 0.4 (Hair et al., 2006). Overall the value of the factor loading of each variable is observed so that it can be concluded that all observed variables of the latent variables are valid. Reliability is needed for internal measures of consistency of indicators of a construct. The approach to assessing the measurement model measure composite reliability (composite reliability).

The results of the validity test using factor analysis show that the loading factor value is above 0.4 so that all items in this research variable are valid or valid. Each factor in this study is reliable because it has an Alpha more significant than 0.6. According to Nunnally (1981), the recommended value of the reliability coefficient is at least 0.6 (Table1.)

Table 1. Factor Loading and Reliability Coefficients

Variable	λ_i	Composite reliability
Perceived ease of use:		.816
PE1	.711	
PE2	.770	
PE3	.776	
PE4	.787	
PE5	.751	
PE6	.721	
Perceived usefulness		.897
PU1	.878	
PU2	.783	
PU3	.869	
PU4	.772	
PU5	.795	
PU6	.853	
The attitude of the IT adoption		.905
SA1	.844	
SA2	.870	
SA3	.882	
SA4	.889	
The intention of the IT adoption		.702
IA1	.758	
IA2	.782	
IA3	.739	
Pressure on the business competition		.890
PB1	.819	
PB2	.884	
PB3	.826	
PB4	.897	

Population and Sample

The research population used as a sample source is SMEs business owners in DIY. The research technique used purposive sampling technique and selected several SMEs that have the potential to support the regional economy. The population in the study was 305 SME entrepreneurs in the craft sector with 37 SMEs in Kulonprogo, 37 in Bantul, 100 in SMEs, Sleman in 61 SMEs, and 17 in Gunung Kidul. The choice of criteria for research objects with consideration to the type of business emphasizes innovation, namely the ability to make changes based on market demands.

Data Analysis Technique

Structural Equation Modelling (SEM) was used to analyst the data in this study. Data analysis was aided by AMOS statistical programs.

RESULT AND DISCUSSION

The characteristics of the respondents in this study are described in the categories of sex, length of business, type of business, and the need for IT adoption. Characteristics of respondents by sex were grouped male and female respondents. Male respondents were 142 respondents or 70%, while female respondents were 62 respondents or 30%. (Table 2).

Table 2. Gender

Num	Gender	Frequency	Percentage
1	Male	142	70%
2	Female	62	30%
	Amount	204	100%

Characteristics of respondents based on length of business are classified into three categories, namely less than five years, 5-10 years and more than 10 years. The majority of respondents were 5-10-year-old business groups, namely 126 people (62%). The group of respondents with a business duration of fewer than five

years as many as 47 people (23%), and groups of respondents with a business duration of more than ten years as many as 31 people (15%), which is the lowest frequency (Table 3).

Table 3. The length of business

Num	Length	Frequency	Percentage
1	<5 year	47	23%
2	5-10 year	126	62%
3	>10 year	31	15%
	Amount	204	100%

Characteristics of respondents based on business type are grouped into six categories, namely crafts and household, culinary/food, agribusiness/fisheries, furniture/board, fashion/clothing, and services.

Respondents in the study were fairly evenly distributed, ranging from the lowest 4% to the highest 35%. The group of respondents with handicrafts and household types were 57 respondents or 28%, the respondent group with culinary/food business types as many as 71 respondents or 35%, the respondents group with the type of agribusiness/fisheries business were 24 respondents or 12%, the respondent group with furniture/board business type as many as nine respondents or 4%, the respondent group with the type of fashion/clothing business as many as 27 respondents or 13%, and the group of respondents with the type of service business as many as 16 respondents or 8% (Table 4).

Table 4. Type of business

Num	Type	Frequency	%
1	Crafts & household	57	28%
2	Food/ Culinary	71	35%
3	Agribusiness/ Husbandry/ Fisheries	24	12%
4	Furniture	9	4%
5	Fashion	27	13%
6	Service	16	8%
	Amount	204	100%

Characteristics of respondents based on reasons for IT adoption are grouped into four categories, namely production, finance, marketing, and communication/information. Respondents who dominated in this study had reasons for IT adoption, namely marketing as many as 63 respondents or by 31% and communication/information needs as many as 54 respondents or 26%. The respondent group with production/product design reasons as many as 21 respondents or by 11%, the respondent group with financial / transaction reasons as many as 39 respondents or by 19% (Table 5).

Table 5. Reasons for Adopting IT

Num	Reasons	Frequency	Percentage
1	Production	21	11%
2	Finance	39	19%
3	Marketing	63	31%
4	Communication/ information	54	26%
	Amount	204	100%

Model Conformity Test

The fit of model test results using chi-square, CMIN / DF, GFI, RMSEA, AGFI, TLI, and CFI are summarized in Table 6. The overall planned model is fit. Overall the Chi-square value with a probability of 0.110 > 0.05 indicates the overall model fit. This means that the model that illustrates the expansion of a properly designed technology acceptance model in predicting the intention of adopting SMEs information technology through the influence of business competition pressure variables on perceived usefulness. Perceived usefulness and perceived ease to use have an effect on the attitudes towards SMEs information technology adoption and attitude variables on SME's information technology adoption towards the intention of adopting appropriate SMEs information technology with empirical data.

Table 6. Goodness of Fit

Index	Cut off Value	Result	Evaluation
Chi-square	Approach 0	112.162	Good
Probability	≥ .05	.110	Good
CMIN/DF	≤ 2.00	.507	Good
GFI	≥ .90	.918	Good
RMSEA	≤ .08	.071	Good
AGFI	≥ .90	.901	Good
TLI	≥ .90	.913	Good
CFI	≥ .90	.903	Good

Model Causality Test

The results of the latent variable variation weights, which are often referred to as estimation of lambda values. Based on the significance of the Critical Ratio (C.R) value with a probability value (p) = 0.05. Further explanation of the evaluation analysis of the regression weights can be described and explained as follows (Table 7).

The business competition pressure variable influences the perceived usefulness significantly with an estimated value of 0.371 with a significance level of 0.000. Thus hypothesis 1 is accepted. The perceived ease of use with an estimated value of 0.423 and perceived usefulness with an estimated value of 0.322 partially influences the attitude of IT adoption significantly at a significance level of 0.000. Thus hypothesis 2 is accepted. The attitude variable on information technology adoption of SMEs affects significantly the intention of adopting information technology with a significance level of 0,000 smaller than the probability value ≤ 0.05 significantly. Thus hypothesis 3 is accepted.

Based on the coefficient of determination, it can be seen that the ease of use and usefulness has a role of 28.3% in explaining the attitude of IT adoption and the attitude of IT adoption can explain the intention of IT adoption by 28.5%

Discussion

Conceptually, the TAM can predict the determinant factor in accepting the use of IT. Perception is formed by usefulness and ease of use according to the model developed by Davis (1989), which explains the behaviour of information systems adoption or information technology (Chau, 1996). In accordance with

The Causality Model is Shown in Figure 1.

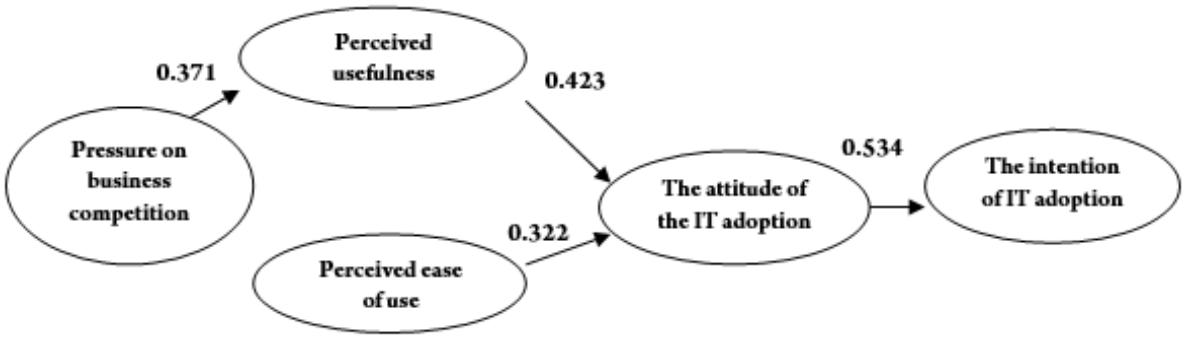

Figure 1. Causality Model

Table 7. Evaluation of Regression Weight

Variable			Estimate	S.E.	C.R.	P
Perceived usefulness	<---	Pressure on the business competition	.371	.254	7.312	***
Attitude of IT adoption	<---	Perceived usefulness	.423	.259	7.312	***
Attitude of IT adoption	<---	Perceived ease of use	.322	.065	9.548	***
Intention of IT adoption	<---	Attitude of IT adoption	.534	.113	4.025	***

***:0,000

the opinion of Venkatesh and Morris (2000) that perceived ease of use refers to the extent to which a person believes that using technology will be free of effort and perceived convenience is a process of expectation. The perceived ease is believed to have a strong influence in forming the attitude of an individual in receiving an information technology from learn aspects, practical to the operation, and ease of adoption as perceived by SME owners.

Perceived usefulness showed the degree to which the user believes that the use of a particular technology will help the individual to finish the task and, according to Davis (1989), which defines perceived usefulness as to how far someone believes that using technology will improve the task performance. The perceived usefulness is believed to have a strong relationship in influencing the attitude of users of information technology. This is understood because when an individual feels that information technology is used to provide usefulness to him, both in completing his daily tasks or activities, the individual will be satisfied with the technology by aspects of effectiveness and efficient reason. This result is supported by description data that IT is widely used by SMEs in production or product design, finance or report transactions, marketing, and communication or to collect the information. The perceived usefulness is also driven by aspects of business competition pressure in the form of competitors who have used IT. Business competition pressure is an external aspect that stimulates the SMEs owner to accept IT. This result is consistent with the findings of (Moy & Luk, 2003; Zhu et al., 2003; Xiaolin 2008; Rowe et al., 2012; Al-Fahim et al., 2016).

Utilization of IT is felt like a necessity by SMEs as part of production, operations, and marketing. The level of use of IT as a competitive value that must be possessed by SMEs. Competitive pressure encourages SMEs to adopt IT as part of the competition. IT adoption is also adjusted to the capacity of each UKM. Constraints on IT knowledge become part of IT adoption according to Astuti (2018).

CONCLUSION AND RECOMMENDATION

Based on the research finding above, it can be concluded that overall the expansion model of the technology acceptance model in predicting the intention of adopting SMEs information technology in this study fulfils the model fit rules, which means that the model developed in this study is by existing empirical conditions. The pressure of business competition has an effect on the benefits that are perceived (usefulness) by SME owners. The perceived ease of use and the perceived usefulness have an effect on the attitude of the SMEs information technology adoption. The attitude of SMEs information technology adoption affect the SMEs owner intention to adopt information technology.

This study has several limitations such as the sample covering the DIY area, besides that there are several internal factors which become antecedents for technology acceptance such as psychological factors that's not discussed in this study.

Based on the research findings and conclusions, some suggestions can be given as follows:

It is practically recommended for the government to support and encourage the level of adoption of information technology for SMEs. Business competition requires the use of IT so that the process of IT adoption can be carried out by socializing the importance of IT in business competition that is directly related to the benefits felt by SME owners. Besides, the user training programs or practical use of IT that makes it easy to use can also help the IT adoption process in SMEs. Facing the level of business competition in the era of disruption, every SMEs needs to adopt IT to improve business competitiveness both from the operating system of production, distribution, finance, and in terms of product marketing.

This research has limitations in identifying the business competition faced by each SMEs so that further research can classify each of the broader SMEs fields and identify business

competition faced. Future studies can consider the psychological factors of SME owners.

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